

127
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REPORTS

TO THE

LOCAL GOVERNMENT BOARD

ON

PUBLIC HEALTH AND MEDICAL SUBJECTS.

(*NEW SERIES* No. 39.)

Dr. S. Monckton Copeman's Report to the
Local Government Board on the General
Sanitary Circumstances and Administration
of the Ely Rural District.



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ARTHUR NEWSHOLME,
Medical Officer,
6th August, 1910.

For several years past the Board have been in correspondence with the Ely Rural District Council in reference to the scanty information afforded by the annual reports of their medical officer of health on certain points relating more especially to the condition and supervision of dairies and cowsheds.

The rural district council, however, have persistently refused, through their clerk, to supply the desired information, or to instruct their medical officer of health to incorporate it in his annual reports. Moreover, although the Board, for many years past, have been urging on the rural district council the necessity for the provision by them of an adequate water supply for the village of Littleport, which contains the largest aggregation of population in the district, the council have, up to the present, neglected their duty in this respect, and indeed, through their chairman, have expressed their intention of not taking any steps in the matter.

As, also, during each year of the last decennium, Littleport has never been entirely free from enteric fever, I received instructions to make an inspection of the general sanitary circumstances and administration of the district. As a preliminary step, I visited Ely, where, at the office of their clerk, I met the chairman and other members of the rural district council, together with their medical officer of health (Dr. Anningson) and the inspector of nuisances (Mr. Green). Subsequently, with Dr. Anningson and the inspector of nuisances I visited Littleport and a number of villages in other parts of the district. At this stage of my investigation, however, the work was interrupted for several months by other specially urgent official work.

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Topographical and Geological Considerations.—The Ely Rural District forms an area of irregular shape, bounded, roughly speaking, on the east by the River Ouse and the Ely Urban District; on the west by the New Bedford level and the Chatteris Urban District; and on the south by the Old West River. The district consists, for the most part, of fenland, rising from which are a number of low hills formed of the Kimeridge clay—a strong, dark-blue clay, which everywhere, at a greater or less depth, underlies the surface in the Fen country. These natural elevations, forming drier ground, have, in many instances, been utilised as sites for villages. In the greater part of the area the soil is indicated by the Geological Survey as peat or alluvium. In the southern portion of the district, between Haddenham and Stretham, the Kimeridge clay is capped by the lower green sand, and in other places by patches of boulder clay; while at Sutton and elsewhere are shallow patches of drift gravel and sand, although, as I learn from Dr. Anningson, this formation has now been excavated to a considerable extent at Sutton.

The Ely Rural District includes fourteen parishes, of which ten possess a parish council. The names of the individual parishes, together with their population, number of inhabited houses, acreage, and rateable value, are set out in the following tabular statement, the figures in which are derived from a return supplied to me by the clerk to the rural district council.

Names of Parishes.	Population. (1901.)	No. of Inhabited Houses.	Area in Acres.	Rateable Value according to Valuation List in force.
				£
Littleport	4,181	927	16,672	22,217
Downham	1,801	415	9,791	14,933
Witchford	364	100	2,272	2,596
Haddenham	1,686	417	8,450	11,158
Redmere	40	7	626	359
Sutton	1,420	355	7,090	9,432
Stretham	1,000	300 (including Thetford).	3,809	6,635
Wilburton	457	115	2,367	3,643
Mepal	324	90	1,616	2,148
Witcham	297	73	2,091	2,633
Coveney	423	115	3,051	3,361
Wentworth	112	39 (including Grunty Fen).	1,331	1,514
Thetford	204	—	1,035	3,543
Grunty Fen	74	—	1,716	1,656
Total	12,383	2,953	61,917	85,828

Housing.—For the most part the housing accommodation throughout the district is adequate for the needs of the population, although in some instances, especially in the fens, the sanitary condition of the dwellings and their surroundings, particularly as regards privies and ash-pits, leaves much to be desired. Bed-rooms, especially, are apt to be small and dark, this being very noticeable in the case of a number of cottages at Littleport, in

which place also I came across several instances of overcrowding. These conditions obtained more especially in the case of Thompson's cottages in Wisbech Road, and of four bungalow cottages of two rooms each, in Silt Road. In one of these cottages practically all the space in the single bedroom was taken up by two beds, one of which, as I was informed, was occupied by the father, mother, and an infant, the second by four other children. One of the cottages in Wisbech Road was extremely dirty.

With the exception of Littleport, Sutton was the only village where definite instances of overcrowding were encountered.

Water Supply of the District generally.—The conditions as to water supply referred to by Dr. Parsons in a report on this district in 1885, persist with comparatively little alteration at the present time. As pointed out by him, except at Aldreth, where a spring, probably from the greensand, is utilised, water supply is obtained from one or other of three different sources, viz. :—

1. Shallow wells.
2. Rivers, fen ditches, and ponds.
3. Rain-water.

Where the Kimeridge clay is overlaid by sand or gravel, water can be obtained from wells, but where the clay rises to the surface little or none is yielded, unless an occasional sandy vein chances to be struck, and even then the water is very hard from the presence of selenite in the clay. At Haddenham, Sutton, Stretham, Wentworth, Wilburton, Witcham, and Witchford, as also in some parts of Littleport and Downham, the supply is obtained from wells, some few of which are public and provided with pumps, although the majority are on private premises. For the most part the wells are "dry-steined," and as they are often situate near to privies and other collections of filth, contamination of the water is apt to occur. In dry seasons the water supply from some of the wells fails altogether, and water may have to be fetched long distances from the rivers.

The question of a water supply for Littleport from the River Ouse receives separate consideration in a subsequent section of this report. Mepal, Wardy Hill, and parts of Downham obtain their supply from rivers, ditches, and ponds. In the fens no good water can be obtained from wells. The water in the fen ditches is often brown and turbid with decaying vegetable matter, while in certain localities sewage matter in greater or less quantity may also be present. During dry weather it is the custom to replenish the ditches occasionally by letting in water from the river at certain points where arrangements exist for the purpose. In some of the villages water has to be obtained from surface ponds, which, in certain instances, are fenced round to prevent access of cattle. At Pymore and Wardy Hill the pond water is passed through a polarite and sand filter before being used.

In some of the villages, and also especially in the fen area, rain-water collected from the roofs of the houses is used for drinking and other domestic purposes. In most instances this is now stored in tanks of galvanised iron of a capacity of two hundred gallons and upwards, according to the requirements of householders. This water, however, is apt to be contaminated with

washings from the roofs, and it is desirable, therefore, that it should be filtered and boiled before use. The condition of such water could be materially improved if provision were made for the first flow of each shower to be allowed to run to waste, but I did not see any instance in which this condition was provided for.

Dairies, Cowsheds, and Milkshops.—No regulations for the control of dairies, cowsheds, or milkshops have been made by the rural district council, although the desirability of making them has been repeatedly urged by their medical officer of health, who, in each of his annual reports for the years 1887-1899, inclusive, referred to the need for such regulations. From 1901 onwards, however, he merely notes that “no regulations have been adopted.”

As showing the attitude of the rural district council on this important question, I set out an extract from the Minutes of a meeting of the Ely Rural District Council held on June 13th, 1907:—

“A letter from the Local Government Board was read, stating that they had observed that in the report of the medical officer of health for 1906 he had not included the information as to the administration of the Dairies, Cowsheds, and Milkshops Order in the rural district requested in their letter of the 28th November last, and that they desired he might be instructed to furnish them with the required information with as little delay as possible. Also drawing attention to the last paragraph of their letter of the 28th November last, and enquiring if the council had reconsidered the question of passing regulations under Article 13 of the Order of 1885.

“The Clerk was directed to state in reply, that the council had not reconsidered the question of making regulations under the Order referred to, nor had the medical officer of health been requested to make a report, as the council did not consider regulations necessary in a district of this character, and that any report from the medical officer of health was uncalled for.”

As having a possible bearing on the attitude of the rural district council, it may be mentioned that of the 22 members constituting that authority, 15 are described in the official return as farmers.

According to a return by the medical officer of health, there are 12 milk purveyors in the district, their farms being situated in the villages of Downham (1), Haddenham (3), Littleport (3), Stretham (1), Sutton (3) and Wilburton (1). Eight of these farms were personally visited by me in the course of my official investigation.

I learned that, throughout the district, it is customary for cows to be kept out at pasture for about two-thirds of the year, from about the middle of March to the middle of November, during which period they are usually brought up twice daily for purposes of milking. For the remainder of the year the cattle are kept in the stockyards, along one or more sides of which rough sheds, completely open to the yards for the most part, and without proper flooring or drainage arrangements, are generally

provided. These sheds, the farmers contend, meet all requirements, the cows being specially hardy owing to the fact that they spend the greater part of the year entirely in the open. I was also informed on several occasions that if the farmers were required to build model cowsheds, the milk business could not be made to pay. Holding such views it is, perhaps, not astonishing that they should use every means in their power to evade adoption of regulations under the Dairies, Cowsheds, and Milkshops Order.

To describe in detail the conditions of all the dairy farms visited in the Ely Rural District would involve needless iteration, since the local circumstances were more or less similar in each instance, all the arrangements falling lamentably short of what should be required by the sanitary authority.

Stockyards often deep in semi-liquid mud; sheds, capable of properly housing half (or less) the total number of cows kept in them, and generally built of wood, with occasionally some corrugated iron or brickwork; in some cases dilapidated; with floors of earth, sometimes at a lower level than the yard; no provision for drainage, and often no attempt at limewashing, together with bad or deficient water supply, afford a picture of the usual conditions, to which, however, exceptions in one or other respect may be encountered.*

Nowhere in the district did I observe a cowshed of which the construction, in the light of modern requirements, could be considered satisfactory. Neither did I meet with any instance in which the cows are properly groomed; or even have their udders and teats washed before milking. In one or two instances I was informed that the men had instructions to wash their hands before milking is commenced, but, on certain occasions where I saw the process in operation, it was perfectly obvious that, if such instructions had been given, no care was taken to ensure their due observance.

Milk produced under such conditions is liable to contain a considerable amount of filth of one or another kind, particles of straw, faecal matter, &c., often being visible to the naked eye on examining a vessel in which the milk is stored. At one farm, where I found some milk in this condition, I was informed that it always had to be strained before being sent off. Of special importance, though not so obvious, is the consequent bacterial fouling, the extent of which, during hot weather, must increase rapidly in those instances in which no process of cooling the milk is adopted.

There are no milkshops, properly so-called, in the Ely Rural District. Much of the milk produced is sent, by rail, to London, and a further quantity is used for the manufacture of soft cheeses; of the remainder, most of what is sold in the district is distributed from door to door by the farmers' carts.

The dairies are, for the most part, not greatly superior to the cowsheds in their constructional conditions. Several that I

* I learn from Dr. Anningson that, especially at Littleport, certain improvements have been carried out since the date of my inspection.

visited, at different farms, were small, dark, and ill-ventilated; a sour smell being a noticeable peculiarity. It is not unusual for the dairy to be used also as the domestic larder.

In pleasing contrast to most of the dairies in the district, mention may be made of one at a farm near Littleport, which, though below ground level, I found to be airy, clean, and with good arrangements for ventilation.

In view of the general circumstances that I have described, it will be obvious that the conditions under which milk is produced in this district are extremely unsatisfactory from the point of view of the public health, and that the adoption and enforcement of regulations under the Dairies, Cowsheds, and Milkshops Order is urgently required.

Slaughterhouses are visited periodically by the inspector of nuisances, and during the past few years considerable improvements have been effected in their structural condition, especially as regards the provision of new cement floors, proper drains, and blood-pits. Those that came under my observation were, for the most part, in fair condition, but at Haddenham the surroundings of two slaughterhouses that I visited there were filthy in the extreme. In one instance I found a heap of hair, entrails, and manure in the back yard, while inside the slaughterhouse the blood-pit was full. Not a single slaughterhouse in the district apparently is provided with an iron wheeled tank with cover for the removal of garbage and refuse.

In a slaughterhouse at Sutton I found the diseased carcase of a sheep hung up and dressed as if in preparation for sale. Dr. Anningson informed me that in the case of this slaughterhouse he had for some time previously been pressing for certain much-needed structural improvements to be carried out.

Bakehouses, of which 27 are on the register, are also periodically inspected. At Downham I found a bakehouse in a filthy condition, and behind it a yard deep in manure and dirty water. The surroundings of another bakehouse in Wilburton were most objectionable. Others that came under my observation were in good order.

Sewerage and Drainage.—The only villages in the district possessing a definite system of sewers are Downham, Haddenham, Littleport, and Stretham. Dr. Anningson states that it has not been found possible to subject the sewage to any special treatment, "except on a small scale in a few instances at Littleport," and in his annual reports he expresses the opinion that special treatment does not seem particularly needful, as the sewage, being discharged into the fen ditches, the water of which is not used for drinking purposes, is rapidly purified "by the ordinary influence of nature." In view, possibly, of certain complaints that have been made to the Board by an adjoining authority, he admits, however, that there are, unfortunately, some instances where the method of sewage disposal gives rise to nuisances through causing pollution of water-courses.

The villages of Coveney, Thetford, Witcham, and Wentworth possess no sewers, while in the remaining villages there are short lengths of sewer originally intended for the carrying off of surface

water only, and constructed, for the most part, in somewhat primitive fashion, of bricks, or of half pipes, inverted one on the other. In a few instances, however, house drains and water-closets have been connected up to these sewers.

Excrement and Refuse Disposal.—In the villages other than Littleport, and to a large extent in that place itself, excrement disposal is provided for in pit privies and pail closets, the contents of which, when emptied, are disposed of on garden ground. Throughout the district pail closets have recently been substituted for the pit privies wherever possible, and existing pits emptied and filled in. As the result of such action pail closets already considerably outnumber the privies still remaining. Even in Littleport, where there exist a number of water-closets, there are nearly seven times as many privies and pail closets. In the remainder of the villages the number of water-closets, as previously mentioned, is quite small.

The district council do not undertake systematic scavenging, even in the larger villages, and householders are therefore under the necessity of themselves disposing of refuse. This, as a rule, is deposited temporarily in ash pits, which, in some instances, are too near the dwellings. As in the case of excremental material, it is eventually got rid of by being dug into garden ground.

LITTLEPORT.

This village, which is distant five miles by road from Ely, and constitutes the place of most importance in the Ely rural district, had an estimated population of 2,350 at the census of 1871, which had increased to about 2,500 at the census of 1901. Contained in the parish of Littleport, however, are a number of small groups of cottages and isolated tenements scattered over about 17,000 acres of fen land, and containing an additional population of rather more than half the number in the village itself.

A considerable portion of the village occupies the summit and eastern slope of a slight elevation known as Littleport Hill, and is situated on the west bank of the River Ouse, the remainder lying on low ground near the river, and occupying the bed of what formerly constituted the main course of the Ouse, now represented merely by a small streamlet called the Croft River, or Holme's Lode, fed by an inlet—called the Docking—from the present River Ouse, in which the water is at a higher level than in the Fen water-courses.*

Littleport Hill, so-called, is formed of boulder clay, overlying Kimeridge clay, and capped by a bed of fine sand and gravel. The more elevated portions of the village lie upon the latter formation; on the hillside the boulder clay, which is a somewhat pervious blue clay, containing boulders, chalk, stones, and seams of sand and gravel, comes to the surface, while, in the low-lying

* This water-course, after falling over a weir, and passing through a culvert is continued in a narrower channel, called the Black Bank Drain.

area, silt is found overlying either Kimeridge clay or peat—this silt apparently representing a marine deposit of the ancient tidal estuary of the Ouse.

The parish of Littleport is entirely agricultural. In the village, however, Messrs. Hope Brothers (shirt manufacturers) have a factory which employs from 200 to 300 hands, mostly girls. Close to the railway station there is also a patent fodder manufactory, where waste straw, hay, &c., are semi-digested by means of steam under pressure. Complaint is made of nuisance from the unpleasant smell to which this process gives rise, especially when the fumes are carried by the wind in the direction of the village.

Enteric Fever in Littleport.—During the past decennium not a year has passed without the notification of one or more cases of enteric fever in the Ely rural district. Of these cases by far the larger number have occurred in Littleport, while in 1904, in which year the largest number of notifications were received, *all* had concern with Littleport alone.

Enteric Fever in Ely Rural District.

Notified Cases.

—	1899.	1900.	1901.	1902.	1903.	1904.	1905.	1906.	1907.	1908.
<i>Whole District ...</i>	37	4	2	1	13	38	22	21	12	7
<i>Littleport Sub-District.</i>	33	1	2	1	12	38	18	19	11	7

Enteric fever has undoubtedly been introduced into Littleport from time to time by persons who had contracted the disease elsewhere, and Dr. Anningson, in a report on the outbreak of 1904, specially states that this was so in regard to a group of cases occurring in the “Town” itself, which had been entirely free from the disease for six months previously. In view, as he says, of past epidemics of typhoid fever that have assailed this place, and in order to compare the incidence on special areas, Dr. Anningson classified the cases into three groups according to locality, viz., Banks of the Ouse, Town, and Wisbech Road and its immediate neighbourhood. He concludes that the disease probably originated along the river bank, from which point it extended into the “Town” and Wisbech Road along the line of water supply from the river. He further adds that of the 109 cases of typhoid fever that occurred in the Littleport sub-district during the years 1890-1903, 71, or 65 per cent., obtained their water supply either directly or indirectly from the river.

Having apparently satisfied himself, therefore, that, for the most part, at any rate, infection was conveyed by drinking water, Dr. Anningson makes but little mention of other possible sources of infection, and does not, except in one instance, suggest that personal contact or environment may have been factors in the spread of infection. There can, I think, be no doubt that specific fouling of the water of the Black Bank Drain has,

from time to time, been concerned in the carriage of infection, owing to the fact that the cottagers living along its course are accustomed to draw water for household purposes, and even for drinking, at points below that at which, on one occasion, as I was informed, vessels fouled with the discharges of one or more enteric fever patients in a cottage close by had been washed into it. In this connection it may be mentioned that the water supply of the public pumps in Littleport is also derived from this source, after passage, however, through one or more polarite and sand filters. The fact that the drinking water supply of Littleport was, in part, taken from this water course, below where it has received the contents of two of the principal sewers of that place, was pointed out by Dr. Parsons in his report, twenty-five years ago, as a disgusting and dangerous state of matters. The filters to the supply to two of the public pumps seem to have been provided since that date; but they afford no remedy for the pollution of that portion of the water supply which is dipped direct from the Black Bank Drain.

Sewerage of Littleport.—The main sewer runs from Victoria Street, near the Coach and Horses public-house, by way of Snipe and Partridge Lane, City Road, Wellington Street, and Pont's Hill, to the outlet into Black Bank "Drain," near which, in order to aid the flow, a 6-inch pipe also discharges which passes beneath the adjoining road from another land drain on the opposite side of the road. The contents of the "Drain," after a somewhat lengthy course through the Fen, are eventually discharged into the River Ouse at the Ten Mile Bank Pumping Station. Connected up with the Littleport main sewer are a number of contributory sewers from other streets and lanes, into which discharge not only house drains and surface-water channels, but also the soil pipes from about 120 water-closets. At intervals along the course of the main sewer are catch-pits, the contents of which are emptied periodically. The flow of sewage under normal conditions is exceedingly slow, and when, at the time of my visit, certain of the man-hole covers were removed, little or no appreciable movement of the sewage was observed at a distance of a few hundred yards from the head of the sewer, even when the contents of a water-cart were discharged into it at that point. In dry weather, especially, there is often complaint of nuisance from the sewers, for the ventilation of which no special arrangements are made.

Water Supply of Littleport.—The greater portion of the existing water supply of Littleport is derived from wells, varying in depth from about 20 feet to 50 feet, which are fed by water percolating through the gravel stratum previously referred to. These wells are believed to number about 200, although no accurate figures are available. A number of houses, however, as already mentioned, derive their supply from the Black Bank Drain, either directly, in the case of tenements alongside it, or from pumps—seven in number—which raise the water from shallow wells, into which it is carried by a 4-inch stoneware pipe, in two instances*

* The remaining pump-wells are not fitted with filtering beds for the reason as I was informed, that in such case the supply, from pumps towards the far end of the pipe, would be insufficient for the filling of water-carts.

after passing through a polarite and sand filter. The joints of this distributing pipe, according to a report by Dr. Anningson, are socketted but uncaulked, and so defective. A pump at Pont's Hill is connected with a supply pipe from a filter, of sand and gravel only, at Quay Hill. Yet other houses, comparatively few in number, situated close to the river Ouse, as at "Sandhill Bridge," obtain their supply—again after passage through a filter bed of polarite and sand—direct from the river.

There being, on geological grounds, no prospect of obtaining good water by the sinking of one or more deep wells, notwithstanding the fact that a "water-finder," commissioned at the instance of the parish council, claimed to have discovered an abundant flow, the alternative sources of supply would seem to be those referred to by Mr. Silcock in his report to the rural district council, dated October, 1900.* These comprise:—

(a) Supply from the Ely City Waterworks at Isleham.

(b) Supply from the river Ouse or its tributaries the Lark and the Little Ouse.

(c) Supply from a well sunk in the chalk, at Beck Row, on the Mildenhall Road.

Estimates of the cost of obtaining a water supply from these different sources will be found in Mr. Silcock's report, which I have appended.

Major Norton, one of the Engineering Inspectors to this Board, held a conference respecting the water supply of Littleport in March, 1907, and reported, as the Board informed the rural district council in their letter of the 3rd April, 1907, that of the several proposals for supplying water to Littleport, he regarded the scheme for obtaining water in bulk from Ely as the most practicable and economical. And there can be no doubt that the Ely water, which is obtained from a deep bore in the chalk at Isleham, distant about six miles from Ely, is of excellent quality, while the available quantity is such as would amply suffice to meet the additional demand in the event of the supply being laid on to Littleport.

The rural district council, however, after coquetting with this scheme over a period of several years, finally dropped its further consideration, the Littleport Parish Council having reported that the expense of installation and upkeep involved in the adoption of this scheme would be prohibitive, in view of what appeared to them to be an exorbitant demand—viz., $10\frac{1}{2}d.$ per 1,000 gallons—on the part of the urban district council.

There is some reason for thinking that the cost would not be as great as the rural district council have assumed it would be, but the objection of the parish council to any such scheme appears somewhat unlikely to be overcome even though it be definitely proved that the cost would not be excessive, both the parish and the rural district councils being indisposed, as I was myself informed by Mr. Joseph Martin, to take any action whatsoever towards the provision of a water supply.

* See Appendix.

As regards the suggestion that a supply of water might be obtained from the river Ouse, I am clearly of opinion that it would be unwise to adopt this source.

This river receives the drainage from a considerable population, and having regard to the findings of the Royal Commission on Sewage Disposal, it would not be practicable by any system of treatment to prevent organisms of intestinal derivation from entering the river.

If, therefore, the river were adopted as a source of supply it would be essential to provide for the most careful and systematic purification of such water by the rural district council before distributing it to the consumers, even if the sewage entering the river above the intake were properly treated. In connexion with this question reference should be made to Part VI. of the Fifth Report of the Commission, pp. 217 *et seq.*

Such careful and systematic purification would necessarily be costly, and it seems to me that in view of the fact that a pure supply can be obtained from the Ely City Waterworks, the river source should not be entertained.

It may further be observed that the district council would probably find it necessary to obtain special parliamentary powers to enable them to abstract water from the river.

A supply from a well sunk in the chalk at Beck Row would be much more expensive than a supply from Ely City Waterworks.

Consequently the rural district council will be well advised to exert their best endeavours to obtain by agreement with the Ely Urban District Council, a supply of water from a pure source, rather than to take water from a river known to receive sewage pollution, and trust to filtration, even after sedimentation, to remove its possibly dangerous properties.

In any case, it is clearly incumbent on the rural district council to see that steps are taken to provide Littleport with an adequate supply of wholesome water without further delay.

In this connection the attention of the rural district council may again be directed to the provisions of Section 56 of the Public Health Act, 1875, to Section 62 of that Act, and to Section 8 of the Public Health (Water) Act, 1878, under which the district council may charge such water-rates and water-rents, either under a scale of charges sanctioned by the Board or by voluntary agreement, as will have the effect of throwing a considerable proportion (probably the major portion) of the cost of the supply on the actual consumers of the water, thus relieving the ratepayers in the outlying portions of the parish who could not use it.

SANITARY ADMINISTRATION.

The Rural District Council of Ely consists of twenty-two members. Meetings of the council are held once a month at Ely.

No adoptive Acts are in force in the district, and the council possess no bye-laws of any description—a circumstance which, according to a statement made to me by the chairman, Mr. Martin, is considered locally as matter for congratulation.

Notwithstanding considerable pressure on the subject from the Board, no regulations have been made under the Dairies, Cowsheds, and Milkshops Order.

There are no outstanding loans.

The *medical officer of health* is Bushell Anningson, M.D., D.P.H., whose first appointment to the post dates from August 26th, 1886. Since that date he has been re-appointed annually. Dr. Anningson, who, until a few years ago, was also medical officer of health for the Borough of Cambridge, also still acts in this capacity for several other neighbouring rural districts. His salary from the Ely rural district council is £60 per annum, and as they have not made application for the Board's sanction to the appointment, no portion of such salary is repaid from county funds. Dr. Anningson is a lecturer on hygiene and public health in the University of Cambridge, and has a good knowledge, both theoretical and practical, of the duties of his post, and is also well acquainted with the sanitary circumstances of this district. He has on many occasions tendered sound advice to the council, from whom, however, he receives but little encouragement in the performance of the duties of his post. The salary paid is, in my opinion, inadequate, and in this connection it may be pointed out that if the rural district council were to obtain the Board's sanction to the appointment half the salary would be a charge on the county fund, so that it would be possible for them to increase the salary without further expense on their part.

The *inspector of nuisances* is Mr. William Green, who lives at Ely. He has been re-appointed annually since October, 1883. His salary was increased in 1902 from £70 to £110 per annum, the amount he at present receives, with an additional £10 yearly as inspector under the Factory and Workshops Act, 1901. Of his salary as inspector of nuisances a moiety is repaid from county funds. Mr. Green in an able and energetic officer, fully conversant with the duties of his post and thoroughly acquainted with the sanitary circumstances of the district. His local knowledge, indeed, proved most serviceable to me during my inspection.

There is no inspection of canal boats at Littleport, although this place is a stage in the traffic by water between Lynn and Cambridge. In his annual report for 1890 Dr. Anningson directed special attention to this point, stating that he is informed that "inconvenience results from absence of any supervision."

The rural district council do not possess an *isolation hospital* other than a small building constructed of wood and corrugated iron, situated at Grunty Fen, about eight miles distant from Littleport, which was erected in October, 1903, to serve as a small-pox hospital, at a cost of £332 10s. Six months later an additional expenditure of £14 was incurred for fencing. The building is not furnished except in respect of stoves, and no patients have been removed to it. There is no caretaker, resident or otherwise, but the inspector of nuisances visits it occasionally.

Referring to the need for an isolation hospital, Dr. Anningson is accustomed to state in his annual reports that, in default of being able to offer removal to such an institution, "advice is given to the householders as to the best means of isolation of cases in

their own homes. The school authorities are informed of the households in which infectious diseases have appeared, with a request to exclude all the members until they are free from infection. When epidemic influence shows a tendency to spread the school authorities are asked to close the schools. In threatened outbreaks of diphtheria prophylactic doses of antitoxin are recommended for the protection of all persons known to have been exposed to the chances of infection, and bacterial examinations of rubbings from the throat and nasal passages of all known 'contacts' is recommended for the discovery of any unsuspected case of the disease." This method, adds Dr. Anningson, "loses much of its value in the absence of any means of isolating the 'contacts.'"

Disinfection.—At the conclusion of a case of infectious illness the infected rooms and the articles contained therein are disinfected with gaseous disinfectants, but there is no machinery in the district for disinfection by heat or steam.

There is no *mortuary* in the district, except at the workhouse. The rural district council do not possess an *ambulance*, but I am informed that one is kept at the workhouse for the conveyance of pauper patients.

The administration of the Midwives Act, 1902, in this district is controlled by the Isle of Ely County Council. The clerk to the County Council informs me that no midwives' roll is kept in the Ely Union. He adds that none of the midwives practising in the district have been specially trained for the work, and that no inspection of midwives is in operation.

In conclusion, I desire to express my thanks to Mr. E. B. Claxton, clerk to the rural district council, to Dr. Anningson, medical officer of health, and to Mr. Green, inspector of nuisances, who all afforded me ready and courteous assistance in the course of my inquiry.

SUMMARY AND RECOMMENDATIONS.

The Ely Rural District affords a typical illustration of defective administration in a backward rural district. The sanitary authority have been remonstrated with, for years, by the Board, without material improvement resulting in the sanitary administration of the district.

One of the first conditions of health is a satisfactory water supply. This the district council have failed to secure, their most noticeable action, so far, in this direction, having been to waste money on the fruitless efforts of a "water-finder."

1. It is of urgent importance, therefore, that the sanitary authority should take steps, without further delay, for providing Littleport with an adequate supply of wholesome water.

2. The district council should also pay more attention than formerly to the discharge of their duties as a sanitary authority, particularly in regard to the provision and enforcement of needful byelaws, and of regulations under the Dairies, Cowsheds, and Milkshops Order.

3. The district council, either by themselves, or in combination with the Ely Urban District Council, should undertake the provision of an adequate and properly equipped hospital for the isolation of patients suffering from infectious diseases.

S. MONCKTON COPEMAN.

APPENDIX.

Mr. Silcock's Report to the Ely Rural District Council on a Water Supply for Littleport.

GENTLEMEN,

I BEG now to lay before you my report on the water supply of Littleport. Your instructions to me were limited to giving you an estimate of the cost of laying on a supply of water from the Ely city waterworks, but I have gone somewhat beyond that limit and have made enquiries as to the capability of the Ely waterworks to give you the supply needed, and have also examined the district to ascertain what other sources of supply are available.

I need not inform you that the parish of Littleport is a very large one, and that its population is very much scattered, and I have had some difficulty in determining the number of persons in the village itself for whom a supply is needed.

After carefully comparing the figures given me, I have taken a population of 3,000 as being the number of persons for whom provision should be made. This population will require 15 gallons of water per head or 45,000 gallons per day, and for the supply of water for purposes other than domestic, I think that 5,000 gallons per day should be added making the total daily supply up to 50,000 gallons.

Having determined the quantity of water required, the next step was to enquire as to the source whence this supply could be obtained.

The village of Littleport is situated at a slight elevation above the surrounding fens on a small hill of clay. This clay is the same bed of material which underlies the whole of the Fen district and is known as the Kimeridge clay. Its thickness has not been proved by boring in this immediate neighbourhood, but it is known to be at least several hundred feet in depth.

There is no water to be obtained by sinking wells in such an impervious stratum as Kimeridge clay, and even if a boring were put down to the underlying rocks it is extremely doubtful whether sufficient quantity of water would be met with. I cannot therefore recommend any underground source of supply in the neighbourhood.

The streams available are the Ouse, the Lark, and the Little Ouse. These rivers all run for a considerable length through the Fens, and are used as main outfall drains for the pumping engines which pump water from the adjoining Fen lands. It is obvious

therefore that water drawn from any of these sources would be subject to pollution by peaty water from these pumping engines.

In addition to this, the waters of these rivers are contaminated by sewage from the towns and villages in their upper reaches, and the fact that the city of Ely found it necessary some years ago to abandon the Ouse as a source of supply, should be sufficient to condemn it for a supply to Littleport.

Analysis of samples of water drawn from the river Ouse, the river Lark, and the river Little Ouse have been submitted to Mr. J. West-Knights for analysis, and in each case he has condemned the water as unfit for drinking purposes, but he has qualified this by stating that careful filtration might so improve these waters as to make them fit for use. With this view your own medical officer concurs.

I have made an examination of the circumstances surrounding the three sources named, and I am of opinion that the waters of the Little Ouse if taken at a point near the end of White Hall Drove and above the pumping engines there, would be likely to prove the most suitable of the three, and I have made an estimate of the probable cost of a scheme of water supply from this source including the necessary pumps, filters, &c., to enable you to see how it compares with others in point of cost.

If this source of supply is excluded, the next point from which good water can be obtained is from the chalk downs of Norfolk and Suffolk, and the nearest place where a suitable site for a well could be found is at Beck Row, on the Mildenhall Road.

At this place a well could be put down from which I should have great confidence in expecting to obtain a copious supply of water for the needs of Littleport. I have made an estimate of the cost of obtaining a supply of water from this source, including well, engines, pumps, and pumping mains.

The site which I have selected is very similar to the site of the Ely waterworks well at Isleham, and would draw water from the same geological formation and under similar conditions.

This brings us to the consideration of obtaining a supply of water from the city of Ely waterworks, and to enable me to form an opinion of the capability of these works to afford the needed supply, I made a special journey to Isleham, where, by the courtesy of Mr. McKelvie and the engineer in charge, I was given all the information I required.

I may say here that I have had a large experience of obtaining water from the chalk of this district, in connection with the King's Lynn waterworks, and at Hunstanton and other smaller places.

After a careful consideration of the position of the Isleham well, and the records of the height at which the water has stood in this well for some years past, and the quantity of water which has been pumped into Ely, I feel confident that there is an ample margin of water to be obtained from this source to afford the 50,000 gallons per day required for Littleport. There is not the least doubt in my mind that the water is there and will come to the well, and I therefore considered the capability of the pumping plant and mains to deal with the additional supply required.

I find that the average daily consumption of water in the city of Ely in the year 1899 was 184,000 gallons per day, and the maximum quantity pumped during 1900 was at the rate of 250,000 gallons per day. In order to pump this quantity of water the engines at Isleham were worked for 95 hours per week or say $13\frac{1}{2}$ hours per day.

It appears therefore that in order to supply the village of Littleport it would be necessary to increase the hours of pumping by less than three hours daily, making the hours of work $16\frac{1}{2}$ instead of $13\frac{1}{2}$ as at present; this additional work would necessitate the employment of an extra engine driver at Isleham, and the proportionate cost of pumping might be therefore slightly increased, but so far as I can see, this is the only objection to the proposal.

The pumping main from Isleham to Ely is of ample size, and could if necessary be used to pass the water at a considerably higher rate than at present.

Taking therefore all the circumstances into consideration it appears to me that there is not the slightest difficulty from an engineering point of view in the city of Ely waterworks affording an ample supply for Littleport. I will deal with the financial aspect of the case after describing the additional works required for the distribution of the water.

Whatever source of supply is adopted there should in my opinion be in the village of Littleport itself or as near as practicable, a service reservoir capable of holding two days supply or 100,000 gallons. This provision is necessary to afford security from a water famine in case of accident to mains or engines requiring some time to repair.

This reservoir must be at such an elevation as to command all the houses to be supplied, and I consider that to meet this requirement the reservoir should be placed near the main road to Ely, between the Grange and Highfield House, and should have a top water level 50 feet above the ground or say 114 feet above Ordnance datum.

This reservoir will take the form of a tower to be built of brickwork and carrying a steel tank. Provision would be made for overflow pipes, emptying pipes and manhole besides the rising main and the necessary valves. I have prepared some sketch designs for such a water tower to enable me to make an estimate of the cost.

In order to carry the daily supply of 50,000 gallons of water from whichever source is selected I should advise that an iron main 5 inches diameter should be used.

If the water is derived from the Little Ouse the main from the engine house would traverse White Horse Drove, and along Mildenhall Road over the Littleport Bridge, and past the station through the village to the service reservoir. The pumping main would serve also as a distributing main for the streets traversed by it.

If the water were obtained from the chalk at Beck Row, the main would traverse the Mildenhall Road and over the bridge and through the village of Littleport by the same route as if the water came from the Little Ouse.

If, on the other hand, your council could secure a supply of water from Ely, the main would be connected to the Ely water-works mains at the most advantageous point for obtaining a good supply.

I have considered the position of the water mains in the City of Ely with relation to the supply of that city, and I am of opinion that an adequate supply could be obtained for Littleport by connecting the new 5-inch main to a 6-inch diameter main which terminates on the Ely and Lynn Road opposite the end of Downham Lane.

The new main would then be carried along the Lynn Road past Chettisham Station to the proposed service reservoir at Littleport. The main would be laid along the side of the road so as to avoid breaking up the metalled carriageway and to reduce the cost of laying.

Accompanying this report is an ordnance map* showing the route of the delivery main from Ely and its connection with the Ely mains.

The distributing mains would start from the tower and be taken along the streets and roads of the village as shown on the map of distributing mains. This map shows by means of red lines the position of the pipes which, in my opinion, should be laid down.

I have no doubt that some members of your council will think that it is unnecessary to lay down mains so far along some of the outside roads, particularly along Wisbech Road, Camel Road, and Ten Mile Bank, but I would point out that the additional cost of these mains, viz., about £300, is very small, and that it will make a considerable difference to the convenience of the inhabitants of the houses abutting on these roads.

The means of distribution from the mains to the consumers should in every well regulated water supply be by means of separate service pipes laid on to each house, and that is the system which I certainly should recommend; but as it may probably be considered by many owners of property that this is an unnecessary expense, I have included in my estimate for a number of standpipes or street fountains. The approximate positions of these standpipes are shown on the plan of the distributing mains, and I have endeavoured to arrange them so that no one will need to walk more than 100 yards to obtain a supply of water.

Having regard further to the protection from fire afforded by the presence of a system of water pipes under pressure, I should recommend your council when laying down new mains to instal a sufficient number of hydrants to enable water to be obtained for fire extinction purposes, and I have included in my estimates the cost of these desirable fittings.

Having now described in outline the works necessary to obtain water from the three sources selected, the next point requiring consideration is the all-important one of cost.

I have made estimates of all three schemes in detail, and the amounts named hereafter include in each case the whole of the works necessary for the completion of the scheme.

The total cost of the respective schemes I place as follows:—

	£
Water from River Lark	9,942
Water from Beck Row	14,351
Water from Ely	7,857

From this it would appear that the supply from Ely would be most economical in capital cost, but I must point out to you that this is not the true test of economy.

In order to ascertain which of the three schemes is really the cheapest, the annual cost must be considered. Now obviously this cannot be definitely determined until it is known on what terms the Ely city council would be prepared to sell their water.

I am of opinion that the Ely council could very well afford to supply water at $4\frac{1}{2}d.$ per 1,000 gallons, but in order to be on the safe side, I have made a calculation based on a price of $6d.$ per 1,000 gallons.

I have made estimates of the working expenses likely to be incurred under each of the other schemes and after adding the sums to be paid for interest on and repayment of capital, I estimate the annual cost of the three schemes as follows:—

	£
Water from Little Ouse	670
Water from Beck Row	925
Water from Ely	856

From this it will be seen that although Ely supply involves the least capital cost it is not really the cheapest, but that the supply from the Little Ouse could be obtained for a smaller annual cost than either of the other two.

The question now arises which of the three schemes should be adopted, and in the consideration of this point I have no hesitation in saying that the Beck Row supply seems to be out of the question on the score of cost, and the choice lies between the Little Ouse and Ely.

Having regard to the doubtful quality of the Little Ouse water, I should certainly recommend your council to endeavour to come to terms with the Ely council. It is quite possible that you may be able to effect a contract for the supply of water at $4\frac{1}{2}d.$ per 1,000 gallons, and if this can be done the annual cost of the Ely water would be reduced to £742, which is only some £72 in excess of the cost of water from the Little Ouse, and on that basis there cannot, I imagine, be two opinions as to which scheme should be adopted.

If the Ely council is unwilling to afford a supply at this price the matter could then be further considered, but I should strongly advise that steps should be taken to approach the Ely council in the first instance.

I am, Gentlemen,

Your obedient servant,

E. J. SILCOCK, C.E.

King's Lynn,

October 11th, 1900.

Copy of Letters ordered by the Ely Rural District Council to be appended to Mr. Silcock's Report.

October 22nd, 1900.

DEAR SIR,

Littleport Water Supply.

I AM much obliged to you for yours of 20th instant with reference to the above.

In reply to your letter, for the sum of £5,000 you could provide the necessary mains from Ely and the distributing mains in the parish and the necessary supply fountains, but excluding the reservoirs and hydrants. This would mean that the annual cost of repayment and interest on capital would be about £255 per annum, and if the quantity of water consumed were reduced, as you suggest, from 15 gallons per head per day to half that quantity, the annual payment for water to Ely at 6*d.* per thousand gallons would amount to £248 per annum, making a total expenditure of £503 per annum, or if the water could be obtained at 4½*d.* per thousand gallons instead of 6*d.*, there would be a further reduction to £441 per annum. This is a little under 3*s.* per head of the population supplied, and seems to me to be a very reasonable sum. I place these figures entirely at your disposal to use in any way you think fit, and if the district council would like to have an alternative report on these lines, I shall be glad to furnish one.

Yours faithfully,

E. J. SILCOCK.

W. Cutlack, Esq.,
The Grange, Littleport.

October 24th, 1900.

DEAR SIR,

I HAVE your letter of yesterday's date and wired to you this evening as follows:—"Cost could be reduced as you suggest, but I should not recommend it."

The difference in cost of a 4-inch main and a 5-inch main would be about £950, but I should not recommend the reduction of the size suggested, as I feel sure without a reservoir the 4-inch pipe would not give a sufficient supply, that is, of course, assuming that practically all the houses in the village were to take water.

I am sending this letter on to the workhouse, as I expect you have your meeting there, and it would not be delivered at Littleport until after you had left.

Yours faithfully,

E. J. SILCOCK.

William Cutlack, Esq. (of Littleport),
The Workhouse, Ely.





R E P O R T S
TO THE
LOCAL GOVERNMENT BOARD
ON
PUBLIC HEALTH AND MEDICAL
SUBJECTS.

(NEW SERIES No. 38.)

Dr. S. Monckton Copeman's Report to the Local
Government Board, on the General Sanitary
Circumstances and Administration of the
Ely Urban District.



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ARTHUR NEWSHOLME,

Medical Officer,

6th August, 1910.

Since March, 1906, a correspondence has been carried on between the Board and the Urban District Council of Ely, in reference to the somewhat scanty information afforded in the annual reports of the medical officer of health as regards the general sanitary circumstances of the district, special stress being laid on the fact that for the year 1905 his report contained no information as to the sanitary supervision of dairies, cowsheds, and milk-shops in the district.

It appears that, previous to August, 1906, dairies and milk-shops had not been registered, and although the urban district council subsequently gave public notice that dairymen were required to send in their names for the purpose of registration, the clerk to the urban district council wrote, in December, 1906, informing the Board that, after full consideration of the subject, the council had directed him to state that they had come to the conclusion that it was quite impossible to carry out the regulations under the Dairies, Cowsheds and Milk-shops Order, in their District.

Further correspondence ensued and at a later date the Board decided that investigation of the local circumstances was desirable and accordingly, while in the district for the purpose of investigating the general sanitary circumstances and administration of the Ely Rural District, I received instructions to extend my enquiry to the Ely Urban District also. This enquiry was commenced in the autumn of 1908, but the necessity for carrying out other specially urgent official work has caused unavoidable delay in the appearance of this report.

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No. 38.

Topographical and Geological Conditions.—The Ely Urban District comprises the City of Ely, together with the outlying hamlets of Stuntney, Prickwillow, Chettisham, and Queen Adelaide.

The population of the district, as enumerated at the census of 1881, 1891, and 1901 respectively, has shown a gradual diminution, somewhat more marked during the more recent of these decennial periods, as shown below :—

Population and number of inhabited houses in Ely Urban District.

	Census year.	Population.	Inhabited Houses.
	1881	8,171	1,719
	1891	8,017	1,726
	1901	7,713	1,740

The *area* of the urban district is approximately 16,732 acres, and in 1910 the rateable value was £44,997.

The City of Ely, which constitutes the more populous portion of the district, is situated about sixteen miles from Cambridge, and is the town of most importance in an extensive fen district known as the Isle of Ely, the greater portion of which consists of agricultural lands. The more closely inhabited part of the city stands on elevated ground which slopes on the south-east to the river Ouse. The cathedral, the threshold of which is at a height of 70 feet above the river Ouse, forms a conspicuous landmark for a considerable distance in all directions.

The surrounding fen-land is flat, and to a considerable extent lower in level than the main watercourses, so that steam-pumping has to be resorted to for drainage.

The soil and subsoil are somewhat different in character in the highlands and fens. In the former situations the surface soil varies in depth from one to three feet, overlying a subsoil of sand of an average depth of six feet. Beneath this a thin bed of sandstone of the lower green-sand is usually encountered, and, lower still, a bed of water-bearing "quick-sand." Beneath this lies the Kimmeridge clay, a bed of considerable thickness, very hard and very retentive, the upper layer of which is still dug in the neighbourhood of Ely for purposes of brick-making. In the fenlands the Kimmeridge clay is overlain by humus and peat for a depth of four to nine feet.

The chief industries of the population are retail trade and agriculture. At Ely, a brewery and a recently-established jam factory employ a number of hands. There is also a fellmonger's yard. Osiers are grown to some extent in the fens, and the peeling of them affords employment to women at certain times of the year.

Water Supply.—The water supply of the City of Ely and of the hamlet of Stuntney is obtained from waterworks belonging to the urban district council; the water being obtained from a bore hole seventy-four feet deep in the chalk, at Isleham, a village situated about six miles south-east of the city. The water rises into a well

25 ft in depth, from which it is pumped to an iron tank, of 320,000 gallons capacity, situated on an elevation, adjoining the workhouse at Ely, from which the water is distributed by gravitation. The hamlet of Stuntney, however, as well as a number of houses in Ely, is supplied directly from the "rising main." There is no filtration of the water. The supply is constant, and there are no cisterns in houses, other than the flushing-cisterns in connection with water-closets.

The supply is abundant and of good quality, and does not appear to be liable to contamination in any way, the water-works being situated at a distance of quite a quarter of a mile from any collection of houses.

The water supply of the hamlet of Prickwillow with about 60 houses, is obtained from the river Lark, which, some twenty miles above receives the sewage of Bury St. Edmunds; while that of Queen Adelaide, with about 20 houses, is obtained from the river Ouse, at a point two miles below the sewage outfall of Ely. In both cases the river water is passed through filters composed of a cubic yard of a mixture of sand and polarite, into a brick chamber placed alongside the filter-bed. From this chamber it is pumped for use.

Excrement disposal—Sewerage and Drainage.—In the City of Ely itself, the water-carriage system of excrement disposal is universal, all houses having water-closets provided with separate flushing cisterns. In most instances the closets, which are of the long or short "hopper" type, are situated outside the houses in yards or gardens. The soil-pipes are unventilated, except in the case of indoor closets in some of the better-class houses. In the outlying hamlets however privy-middens are almost invariably installed, the scavenging of which is carried out or arranged for by the occupiers.

The sewerage system of Ely, which was laid down in 1855, consists of two sections, the high-level and low-level mains respectively. The high-level sewer, which is constructed of 10-inch pipes, receives the greater part of the sewerage of the city, and is joined by a number of branch sewers in different parts of its course. These branch sewers have for the most part a diameter of six inches. The high-level sewer has a sufficient fall, but its course is circuitous, while its capacity is unduly small for present-day requirements, the manholes along its course usually containing pent-up sewage. There is no special provision for flushing or ventilating either the high or low-level sewers. The latter has a very slight fall, and in the area served by this sewer flooding of cellars and basements of houses is especially apt to occur after heavy rain.

There is a storm-outlet, direct to the river, at Annesdale, which is opened when the low-level sewer is flooded. In former years this was frequently necessary owing to the silted-up condition of the sewers, but I am informed by the inspector of nuisances that the condition of affairs has been much improved since the sewer was cleaned out and partially relaid during the years 1904-1906.

The whole sewerage system, in the first instance, was badly planned and imperfectly constructed, while for the most part its

course was not carried along the road-ways but behind houses and through fields and gardens. In some instances houses have been erected immediately over the sewer mains.

The whole sewerage system converges to a short outfall sewer, the contents of which, after passage through two settling tanks in which a certain amount of sedimentation takes place, is discharged without further treatment into the river Ouse at Riverside.

Certain outlying collections of houses discharge their sewage direct into water-courses.

Slops and other liquid refuse are, for the most part, disposed of by being thrown down the pans of water-closets, or into trapped gullies which are generally to be found in the back-yards of houses or in common courts. The drainage of certain of the courts, yards, and slaughter-houses is defective.

Refuse Removal and Disposal.—In January, 1905, the urban district council instituted a collection of refuse, on alternate days, from every part of the city. Regular rounds are made daily, the men and horses being supplied by contractors while the carts are the property of the council. The scavengers do not go on private premises, the inhabitants being required to place outside their doors, by a fixed time in the morning, dust, cinders, and other household refuse in boxes, pails or other receptacles. The inspector of nuisances informed me that there are only about a dozen ash-bins in the district. These are mostly used for the disposal of trade-refuse of various kinds, which has to be disposed of eventually by the occupiers of the premises.

The refuse collected by the council's carts from the upper part of the city is dumped at Mill-pit (a disused sand-pit) while that from the remaining area is disposed of at Scott's orchards, Willow Walk, a payment of £10 per annum being made to the owner of the property by the council.

The scavenging carts when not required for the collection of household refuse are employed in connection with road cleaning.

Dairies, Cowsheds and Milkshops.—In November, 1898, Regulations under the Contagious Diseases (Animals) Act, 1886, and the Dairies, Cowsheds, and Milkshops Order, 1885, came into force in the urban district, but no steps have been taken by the council to enforce their requirements, the members of the urban council apparently being of opinion that restrictions, especially as regards the construction and cleansing of cowsheds, would unduly hamper the milk-trade.

In March, 1906, the Board wrote to the urban district council calling attention to the fact that the report of their medical officer of health for 1905 did not contain information as to the sanitary supervision of dairies, cowsheds and milkshops in the district, and requesting that the council would give instructions to the medical officer of health to prepare a report on the subject.

This letter was sent on by the council to the medical officer of health (Dr. Harris) who, a few days later, wrote direct to the Board acknowledging its receipt, and adding "the dairies and milkshops are not registered throughout the district, consequently I have no means of becoming acquainted with the work I am supposed to report upon." Further communications thereupon passed between

the Board and the council as the result of which, the clerk wrote in August, 1906, that his council had "ordered that notice should be given by means of advertisements in a local newspaper and by hand-bill requiring dairymen, &c. to send in their names for the purpose of registration in compliance with Article 6 of the Dairies, Cowsheds, and Milkshops Order of 1885."

Shortly afterwards Dr. Harris carried out the inspection of "twenty-five of the principal cowsheds and dairies existing in Ely and its district," as the result of which he reported that, in his opinion, "there is hardly one that comes anywhere near to the requirements of the Local Government Board."

The Board on receipt of this report, having made enquiry as to what action the council proposed taking with a view to improving the condition of the cowsheds, so as to bring them into conformity with the regulations in force in the district, the council replied, that, after careful consideration of the report of their medical officer of health, they had come to the conclusion that it was quite impossible to carry out the regulations under the Dairies, Cowsheds, and Milkshops Order in the Ely Urban District. Thereupon copies of the model regulations were sent to them with the suggestion that the council should consider whether there would be advantage in substituting these for the regulations supposed to be in force in the district. To this suggestion, however, the council did not reply.

In his annual report for 1906 the medical officer of health refers to the consideration by the council, during the year, of "the difficult question of the bye-laws in connection with the cowsheds and dairies," adding "I have visited a large number, and I am quite at a loss to know how to deal with them to the satisfaction of the Local Government Board without practically ruining the milk-trade in Ely."

In March, 1907, the Board again wrote asking for a further report from the medical officer of health on the subject, in connection with which request the following extract from the minute book of the urban district council is of interest :—

"A letter dated the 19th March, 1907, was read from the Local Government Board drawing the attention of the council to their letter of 13th February, 1907, to which they had received no reply :—Ordered that the clerk reply thereto, stating that the medical officer of health had been away from home for some time, and also write to the medical officer of health and request him to make arrangements with the surveyor to inspect the dairies and cowsheds and forward such report to the council in order that it might be sent to the Local Government Board."

The minute book shows, however, that the words "cowsheds" in the above extract has been subsequently deleted, such alteration having been authenticated by insertion in the margin of the page of the initials "T. B. G." (those of Mr. T. B. Granger, chairman of the urban district council); this having been done, as the clerk informed me, in answer to a question on my part, by sanction of the council. In reply to a further question I also learnt from the clerk

that, in consequence, the medical officer of health had received a definite instruction that he was *not* to include cowsheds in his inspection and subsequent report.

The medical officer of health, in due course, reported to the council that having completed his visits "to the dairies in the City of Ely," he found that of the number registered (15 in all) five were "satisfactory" and ten "not satisfactory." To the owners of the latter he had given orders for the necessary alterations to be carried out, of which some had been complied with, at the date of his report (June, 1907). In accordance with a request from the Board, Dr. Harris also included references to his inspection of dairies in his annual report for 1907, stating that the results of his visits had been most satisfactory. "All these dairies were originally reported in one way or another as unsatisfactory; alterations were suggested and were carried out to the entire satisfaction of the city surveyor and myself, with the exception of one house. I understand the people are leaving and giving up the supply of milk; if this is not so the council should deal with it without further delay."

In the course of my official inspection I visited five of the cowsheds and dairies registered in the urban district, of which one, a farm on which the largest number of cows is kept, is in the occupation of a member of the urban council. At the time of my visit, of 36 cows "in milk" I found 21 stalled in a large barn divided longitudinally into two parts by a high brick wall extending from floor to roof. This wall being unprovided with openings of any sort, renders "through" ventilation from side to side impossible. Owing doubtless to this fact, a strong ammoniacal smell was perceptible on entering the building. In other respects, however, there appeared no special cause for complaint, except that more care might be taken in the cleansing of the teats and udders of the cows and of the men's hands before the operation of milking is commenced. All the milk from this farm is consigned, by rail, to a dairy company in London, the labels attached to the churns bearing a warranty to the effect that the milk is pure, containing all its cream, and complying in all respects with contract conditions.

From another farm, the occupier of which is also a member of the urban district council, all the milk from an average number of 21 cows is sold to a local purveyor. Here the yards though extensive, are apparently undrained. The sheds, however, in which the cows are kept when "up" from grass are modern and substantial in character. They are all completely open to the yards on one side.

The dairy at another farm, keeping the same number of cows, had been recently built and was in all respects clean and well adapted for its purpose. The floor was tiled and the windows filled with widely perforated zinc. Unfortunately, however, the cowsheds did not come up to the same excellent standard. They provide for only about half the cows which are kept, are unfloored, and apparently have never been lime-washed. They are, however, completely open on one side, and it should be mentioned that, as is the prevalent custom in the district, the cows are kept out in the open for the greater part of the year.

The surroundings of two other cowsheds visited were, however, in a filthy condition, with huge accumulations of manure in the yards, and, in one instance, in addition, large quantities of waste material of various kinds were littered about.

Slaughter-houses.—Of special importance from the point of view of the public health is the disgraceful condition of several of the slaughter-houses in the city of Ely. This condition of affairs is obviously of long standing and the attention of the urban district council has been directed, time after time, to the necessity for reform in this direction, not only by complaints from local rate-payers, but from special reports which have been made to them on the subject from their medical officer of health. Thus, in September, 1893, Dr. Harris reported to them as follows :—

“ I again beg to draw your attention to the slaughter-houses in Ely. Last week a death took place at a butcher’s shop in St. Mary’s Street (with slaughter-house attached) from English cholera. . . . With slaughter-houses in the very heart of the city, situated in the principal streets, and hemmed in on all sides by dwelling-houses, I do think if they are still allowed to exist, it should be only under the most exacting bye-laws that can be made.”

In the following year Dr. Wheaton, one of the Board’s medical inspectors, reporting on the sanitary circumstances of the city in connection with the cholera survey of that year, notes that there are in Ely, eight slaughter-houses, all registered, but for the most part very dirty, badly drained and with defective and filthy flooring. He adds that, in some instances, he found considerable collections of manure adjoining the slaughter-houses.

As, I presume, some extenuation for the continued prevalence of such conditions, the clerk to the urban district council, in writing to me on the subject, states that he finds, on enquiry, that the complaints which have been made from time to time, of nuisances at the largest and most insanitary of the slaughter-houses in Ely were only made verbally to the inspector of nuisances. On the premises being visited by the official he found that offal and manure required removal, and gave notice to this effect, with the result that his instructions were carried out. The clerk adds, however :—“ This has been a running nuisance.”

Some action indeed has been taken by the urban district council of recent years, for I learnt that, under date 27th May, 1908, the sanitary authority issued to the owners and occupiers of slaughter-houses, a large bill on which were set out the bye-laws in force in the district, the special provisions and penalties in connection therewith being underlined. In the course of my inspection, I saw copies of this bill displayed in certain of the premises visited by me. But so far as I was able to learn no further steps have been since taken, at the instance of the council, to see that the provisions of the bye-laws are carried into effect, and I was informed by the clerk that no penalties have been enforced.

Of the slaughter-houses visited by me, the one which is of most importance as regards both the trade carried on in connection with it, and the insanitary condition of the premises, is that referred to by Dr. Harris in his 1893 report set out above. This is situated at

the back of a butcher's shop which fronts to Forehill, one of the chief business thoroughfares in the city. The slaughter-house is approached by a back street leading into a dirty yard, paved with rough cobble-stones, in the depressions between many of which blood stained fluid had collected. On one side of this yard are pens for sheep and cattle, the latter opening into the slaughter-houses ; while between the pens and stables I found a large manure heap, concerning the smell from which, the medical officer of health and the chairman of the urban district council who accompanied me, both stated that many complaints are received, more particularly in summer. The floor of the slaughter-house is laid with uneven flagstones, some of which are loose, thus affording opportunity for fluid to collect beneath them, which oozes up from the interstices between them when certain of the "flags" are trodden on. On my calling attention to the presence of a most objectionable smell in the slaughter-house, one of the slaughtermen at once removed from a hook the head of a bullock which was evidently in a state of decomposition.

It is evident that the district council have taken no efficient steps to deal with the recurring nuisance presented by the condition of this slaughter-house, which, as stated in Dr. Harris' report, is hemmed in on three sides by dwelling-houses. Under the byelaws in force in the Ely Urban District, the occupier should be held responsible for the general want of cleanliness of the slaughter-house and its surroundings, and for the retention on the premises of accumulations of manure of such dimensions, as I was informed was almost invariably the case.

In pleasing contrast was the condition of two smaller slaughter-houses in each of which the floor had been laid with concrete, and the walls well lime-washed. At other slaughter-houses visited, defects of one or another kind were observed which it is unnecessary to describe in detail. It should be mentioned, however, that in one instance a dog was found in a slaughter-house at a time when slaughtering was actually in progress.

Offensive Trades and Trade Nuisances.—In Broad Street, Ely, is situated a fellmonger's establishment, consisting of a line of wooden sheds, opening off one side of a long narrow yard extending from Broad Street to the river Ouse. In one of these sheds I found a great accumulation of horns and hoofs of cattle, which is said to be removed by a rag and bone merchant once a month, or in the summer once every fortnight. In another part of the yard was a large heap of horse manure. The wooden buildings are mostly in bad repair, but the occupier stated that the trade has fallen off in late years, and rather than remodel his premises he would cease business altogether. All effluents are carried by drain to the river, while the soaking pit has a large door opening also to the river. Several of the neighbours complained to me of the nuisance arising from the fell-monger's premises, especially in warm weather.

Fat-boiling is carried on in connection with one or more of the slaughter-houses, but not apparently on any extensive scale.

Complaints also reached me, from several quarters, as to nuisance arising from the smells emanating from a fried-fish shop, situated in Broad Street.

Common Lodging-houses.—Three small dwellings are licensed as common lodging-houses. They are under control of and are inspected by the Superintendent of Police, by whom a quarterly report is made to the council.

Dwellings of the Poor—Overcrowding.—Both in the City of Ely and also in the outlying hamlets there exist a certain number of cottages in a more or less dilapidated condition, without eavesputting, with defective brick floors, damp walls and deficient provision for ventilation. There are no actual back-to-back houses, but in some cases back windows cannot be provided owing to the dwellings abutting on barns or other buildings.

Dr. Lee, reporting on the sanitary condition of Ely in 1850, refers to the existence of a number of courts “much confined and “in many places closely built up, especially on the south side of “High Street and the south side of Forehill.” Some of these have been demolished, but crowding of dwellings, whether in courts or otherwise, is still prevalent in certain areas of the district, of which Victoria Square, Broad Street; Muriel’s Court, Newnham; and Bull Lane Cottages afford examples. In Victoria Square, for instance, twelve cottages surround an unpaved yard in the centre of which is a gully intended for the disposal of household slops and waste water. Inspection, however, showed that such material is apt to be thrown indiscriminately over the surface of the yard. Each cottage has a water-closet, located in an adjoining small and dark wash-house, which, in some instances, appeared to be also used as a larder.

Owing to insufficient cottage accommodation, overcrowding of persons in dwellings is always more or less prevalent, especially at certain times of the year, such as those at which “fairs” are held in the city. From time to time the medical officer of health has brought this condition of affairs verbally to the notice of the urban district council; but I find from his journal, and also from an entry in the minute book of the council, that, in October, 1907, he presented to the sanitary authority a special report dealing with certain cases of overcrowding in Barton Road, Silver Street (2) and Bull Lane (2), respectively. In four of the five cottages visited and reported on by him, a single bedroom, in each instance without fire-place, was occupied by husband and wife, with from three to seven children, some of the latter being adults. Concerning these cases the clerk to the urban district council informs me that he was directed to give notice to the tenants to abate the nuisance within one month; but no further action appears to have been taken. The clerk adds:—“It is most difficult to deal with these cases, the tenants “being unable to obtain suitable cottages. In one particular case “a tenant was ejected (by an authority other than the council) with “the result that the tenant, his wife and family were inmates of the “workhouse for some considerable period.”

While in Ely, I learnt that a local builder had informed the council that in order to meet the requirements of such cases, he was willing to put up fifty cottages to be rented at 2s. 6d. per week each, “provided that the building bye-laws were relaxed.”

Among instances of overcrowding which came under my own observation I need mention but one. The dwelling consists of a cottage containing three small rooms, a living room of 803 cubic feet capacity, a ground floor bedroom of 786 cubic feet, and an upstairs bedroom of 485 cubic feet, with a roof sloping almost to the floor on two sides and one tiny window on the floor level. The family inhabiting this tenement consisted, as I was informed, of a man and his wife ; two daughters aged 19 years and 4 years ; and three sons aged 13 years, 10 years, and 2 years, respectively. The outside walls of this particular cottage are composed of rubble and the interior is so damp that, in the downstairs bedroom, the paper was falling off the wall in places.

SANITARY ADMINISTRATION.

The Ely Urban District Council which consists of fifteen members, of whom six are officially described as farmers, meets once in each month, at the Shirehall.

Bye-laws are in force with regard to the following subjects, the dates given, in each instance, being that on which their operation was sanctioned by the Board :—

Nuisances	30th July, 1898.
Slaughter-houses	30th July, 1898.
Common lodging-houses	22nd December, 1898.
New streets and buildings	22nd December, 1898.

Regulations under the Contagious Diseases (Animals) Act, 1886 and the Dairies, Cowsheds and Milkshops Order, 1885, came into operation 1st November, 1898.

No adoptive Acts are in force in the urban district.

The medical officer of health is Spencer Clabon Harris, L.F.P.S., Glasgow, L.M., L.S.A., who was first appointed in July, 1886. At the present time he receives a salary of £50 per annum, of which the moiety is repaid from county funds. Dr. Harris also holds the posts of public vaccinator and district medical officer, and is in private practice in the city. He does not possess any diploma in public health. Owing to his long residence in Ely he has a good knowledge of his district and of the local sanitary conditions. He keeps practically no written record of the work he carries out in connection with his appointment as medical officer of health, there being no entry in his "journal" of visits to private premises since October, 1907, when there is reference to certain cases of overcrowding. Subsequent entries deal mainly with half-yearly visits to schools and slaughter-houses. But, as shown by the minute books of the urban district council, he has, from time to time, proffered useful advice to the sanitary authority, from whom, however, he has received but scanty support in the execution of his duties.

The inspector of nuisances is William McKelvie, A.M.I.C.E., who was appointed in July, 1888. He holds in addition the posts of surveyor and inspector of factories and workshops. He also had control of the water-supply. He is paid a total salary of £150 per annum, of which he receives £60 in respect of his duties as inspector of nuisances. Of this latter sum half is repaid from county funds.

He does not possess the certificate of the Royal Sanitary Institute or other sanitary qualification. He has a good knowledge of his district, and appears to be an able and energetic officer.

The greater portion of his time, however, is taken up by his duties as surveyor, and in connection with control of the water-supply, so that although he attends to complaints when made to him he does not, as a rule, seek out nuisances and other sanitary shortcomings on his own initiative.

I examined his report book, the entries in which are mainly concerned with defects of water-pipes and taps; the only entry for some time past, dealing with his work as inspector of nuisances, being a record (in October, 1907) of certain cases of overcrowding, the premises concerned, seven in number, having been visited by him together with the medical officer of health.

There is no hospital for infectious diseases in the district and the council possess neither mortuary nor ambulance. They have, however, erected a Thresh's steam disinfecting apparatus, adjoining the main sewage outfall works.

Disinfection of premises, after occurrence of cases of infectious disease, is carried out by means of fumigation with sulphurous acid gas, but stripping of paper from walls and whitewashing is not undertaken unless by the householders themselves.

As regards administration of the Midwives' Act, 1902. I learn from the Clerk to the County Council that he has no roll of local midwives, and no inspection of midwives practising in the district is in operation.

SUMMARY.

In certain respects, as will be seen from the contents of this report, the Ely Urban District Council have satisfactorily performed the duties incumbent on it as a sanitary authority. In past years, good work has been done in providing a public water-supply, good in quality and sufficient in quantity; in adopting universally the water-carriage system of excrement disposal, and in undertaking the collection and disposal of ashes and house refuse throughout the city.

On the other hand, however, the council have hitherto failed to provide hospital accommodation for persons suffering from infectious diseases; while slaughter-houses, in certain instances, have fallen into and been allowed to remain in a deplorably insanitary condition, reports from the medical officer of health and repeated complaints on the part of private residents having been productive of no efficient action as regards enforcement of existing regulations. The council has also been very lax in dealing with the condition of cowsheds and dairies in their district.

In conclusion, I desire to express my thanks to the chairman, and to the clerk of the Ely Urban District Council, as also to the medical officer of health and the inspector of nuisances, for the assistance so readily and courteously afforded me during the progress of my investigation.

RECOMMENDATIONS.

1. The Ely Urban District Council, either by themselves or in combination with the rural district council, should at once undertake the provision of an adequate and properly equipped hospital for the isolation of patients suffering from infectious disease.

2. The urban district council should enforce their bye-laws with respect to slaughter-houses. They should also enforce their regulations under the Dairies, Cowsheds and Milkshops Order, 1885.

3. Nuisances should be sought out, and prompt measures should be taken to effect their abatement.

4. The urban district council should take the necessary steps to prevent pollution of the river Ouse, whether from the discharge of insufficiently treated sewage from their own disposal works, or of effluents from any trade or private premises in the district.

S. MONCKTON COPEMAN.
